

## CLAIMS

What is claimed is:

1. A method of testing an engine coolant temperature (ECT) sensor in a vehicle comprising a processor in communication with the ECT sensor and an intake air temperature (IAT) sensor, the method comprising the steps of:
  - 5 receiving an ECT reading from the ECT sensor and a IAT reading at the processor;
  - evaluating a temperature difference between the ECT reading and the IAT reading to determine if an irrationality is present, wherein the evaluating step comprises monitoring the IAT reading during operation of the vehicle to
  - 10 identify the presence of an engine block heater if the temperature difference exceeds a pre-determined threshold; and
  - providing a rationality indication in response to the evaluating step.
2. The method of claim 1 wherein the evaluating step comprises comparing the temperature difference to a second threshold, and providing a pass indication if the difference is less than a second threshold.
3. The method of claim 1 wherein the monitoring portion of the evaluating step comprises observing a decrease in the IAT reading during operation of the vehicle to thereby identify the presence of the engine block heater.
4. The method of claim 3 wherein the observing step comprises concluding that the engine block heater is present if the decrease in the IAT reading exceeds a third threshold.
5. The method of claim 1 wherein the providing step comprises providing a default value if the irrationality is identified in the evaluating step.

6. A method of identifying irrationality in an engine coolant temperature (ECT) sensor in a vehicle comprising a processor in communication with the ECT sensor and an intake air temperature (IAT), the method comprising the steps of:

5        computing a difference between an ECT received from the ECT sensor and a IAT received from the IAT sensor to determine a temperature difference;

             evaluating the temperature difference to identify irrationality in the ECT sensor, wherein the evaluating step comprises:

10        if the temperature difference is less than a first threshold, determining a “pass” condition;

             if the temperature difference exceeds a second threshold, determining a “fail” condition; and

             if the temperature difference lies between the first threshold and the  
15        second threshold, monitoring the IAT during operation of the vehicle to determine whether an engine block heater is present in the vehicle; and

             providing an indication if an irrationality in the ECT sensor is identified during the evaluating step.

7. The method of claim 6 wherein the monitoring portion of the evaluating step comprises determining if the engine block heater is present in the vehicle based upon a drop in the IAT during operation of the vehicle.

8. The method of claim 6 wherein the providing step comprises providing a default value if irrationality is identified in the evaluating step.

9. A data processing system for a vehicle, the data processing system comprising:

             an engine coolant temperature (ECT) sensor configured to monitor the ECT of the vehicle;

5           an intake air temperature (IAT) configured to monitor the IAT of the vehicle; and

                  a processor in signal communication with the ECT sensor and the IAT sensor to receive the ECT and the IAT, wherein the processor is configured to evaluate a temperature difference between the ECT and the IAT to  
10       determine if irrationality is present, to monitor the IAT during operation of the vehicle to identify the presence of an engine block heater if the temperature difference exceeds a pre-determined threshold, and to provide an indication if irrationality is present in the ECT sensor.

10.       The data processing system of claim 9 wherein the processor is further configured to produce a control signal for an engine component of the vehicle, and wherein the control signal is produced as a function of the indication.

11.       A data processing system for a vehicle comprising an engine coolant temperature (ECT) sensor configured to sense the ECT of the vehicle and an intake air temperature (IAT) configured to sense the IAT of the vehicle, the data processing system comprising:

5           a processor in signal communication with the ECT sensor and the IAT sensor to receive the ECT and the IAT; and

                  a digital memory in communication with the processor, the memory having instructions executable by the processor stored therein, wherein the instructions comprise:

10           a first code module configured to evaluate a temperature difference between the ECT and the IAT to determine if irrationality is present;

                  a second code module configured to monitor the IAT reading during operation of the vehicle to identify the presence of an engine block heater if the temperature difference exceeds a pre-determined threshold; and

15           a third code module configured to provide an indication if irrationality is present in the ECT sensor.

12. The data processing system of claim 11 wherein the digital memory further comprises a fourth code module configured to produce a control signal for a component of the vehicle as a function of the indication.

13. The data processing system of claim 12 wherein the digital memory further comprises a fifth code configured to provide a default value to the component if irrationality is identified in the evaluating step.

14. A digital storage medium having computer-executable instructions stored thereon for identifying irrationality in an engine coolant temperature (ECT) sensor in a vehicle comprising a processor in communication with the ECT sensor and an intake air temperature (IAT),  
5 wherein the computer-executable instructions comprise:

a first code module configured to evaluate a temperature difference between the ECT and the IAT to determine if irrationality is present;

a second code module configured to monitor the IAT during operation of the vehicle to identify the presence of an engine block heater if the  
10 temperature difference exceeds a pre-determined threshold; and

a third code module configured to provide an indication if irrationality is present in the ECT sensor.

15. The data processing system of claim 14 wherein the instructions further comprise a fourth code module configured to produce a control signal for a component of the vehicle as a function of the indication.

16. The digital storage medium of claim 15 wherein the instructions further comprise a fifth code module configured to provide a default value to the component if irrationality is identified in the evaluating step.

17. A device for identifying irrationality in an engine coolant temperature (ECT) sensor in a vehicle comprising a processor in communication with the ECT sensor and an intake air temperature (IAT), the device comprising:

5 means for receiving an ECT reading from the ECT sensor and a IAT reading at the processor;

means for evaluating a temperature difference between the ECT reading and the IAT reading to determine if irrationality is present, wherein the evaluating means comprises means for monitoring the IAT reading during  
10 operation of the vehicle to identify the presence of an engine block heater if the temperature difference exceeds a pre-determined threshold; and

means for providing an indication in response to the evaluating step.

18. The device of claim 17 further comprising means for producing a control signal for a component of the vehicle as a function of the indication.

19. The device of claim 18 further comprising means for providing a default value to the component if irrationality is identified in the evaluating step.

20. The device of claim 17 wherein the monitoring means comprises means for observing a decrease in the IAT reading during operation of the vehicle to thereby identify the presence of the engine block heater.

21. A device for testing an engine coolant temperature (ECT) sensor in a vehicle comprising a processor in communication with the ECT sensor and an intake air temperature (IAT), the device comprising:

5 means for computing a difference between an ECT reading received from the ECT sensor and a IAT reading received from the IAT sensor to determine a temperature difference;

means for evaluating the temperature difference to identify irrationality in the ECT sensor, wherein the evaluating means comprises:

means for determining a “pass” condition exists if the temperature  
10 difference is less than a first threshold;

means for determining a “fail” condition exists if the temperature difference exceeds a second threshold; and

means for monitoring the IAT reading during operation of the vehicle to determine whether an engine block heater is present in the vehicle if the  
15 temperature difference lies between the first threshold and the second threshold;

means for providing an indication if the evaluating means identifies irrationality in the ECT sensor.

22. A data processing system for a controlling a component of a vehicle, the data processing system comprising:

an engine coolant temperature (ECT) sensor configured to sense the ECT of the vehicle;

5 an intake air temperature (IAT) configured to sense the IAT of the vehicle;

a processor in signal communication with the ECT sensor and the IAT sensor to receive the ECT and the MAT; and

a digital memory in communication with the processor, the memory  
10 having instructions executable by the processor stored therein, wherein the instructions comprise:

a first code module configured to evaluate a temperature difference between the ECT and the IAT to determine if irrationality is present;

a second code module configured to monitor the IAT reading during  
15 operation of the vehicle to identify the presence of an engine block heater if the temperature difference exceeds a pre-determined threshold;

a third code module configured to provide an indication if irrationality is present in the ECT sensor; and

20 a fourth code module configured to produce a control signal to the component as a function of the ECT and of the indication.

23. The digital storage medium of claim 22 wherein the instructions further comprise a fifth code module configured to provide a default value to the component if irrationality is identified in the evaluating step.